REMARKS

Applicant thanks the Examiner for the continued careful consideration of the application.

Claims 21-35 above correspond to misnumbered Claims 20-34, and reflect the renumbering as stated in the third line of page 3 of the Office Action.

New Claims 36 and 37 are supported by the specification and claims as originally filed, including page 6, line 5 through page 7, line 14, and page 40, line 12 through page 41, line 19.

The Office Action on page 3 alleges that Claim 5 and renumbered dependent Claims 22-23, 25 and 27-35 are indefinite in failing to particularly point out and distinctly claim the subject matter of the invention. Applicant respectfully maintains that these claims are in full compliance with the statute and rules, but in order to expedite the application, Applicant hereby amends the terms in Claim 5 which are mentioned in the penultimate paragraph on page 3 of the Office Action.

The Office Action on pages 4-5 alleges that Claim 5 and renumbered Claims 21-35 are anticipated by Suzuki et al. (U.S. Patent No. 5084078). Applicant respectfully maintains that Suzuki does not anticipate the presently claimed invention, and moreover, Suzuki teaches away from the presently claimed invention.

Suzuki discloses an exhaust gas purifier unit which may be used in association with exhaust gases from internal combustion engines on cars and ships. See column 1, lines 14-15. The invention comprises a bridged stream corona generator with a high voltage applied between the first and the

second electrode. See column 2, lines 42-44. The first electrode may be a stainless rod. See column 3, line 66.

Suzuki teaches away from the presently claimed invention because Suzuki discloses that the second electrode must be adjacent to a solid insulator. At least three embodiments are disclosed. Second electrode 2 may be made by sintering a metal paste on the surface of an insulator. See column 4, lines 12-13. In the first alternative, second electrode 2 may have an organic glass applied to the surface in order to form an insulator. See column 4, lines 14-18. The second alternative is a simple combination of an insulative pipe and a metal pipe. See column 4, lines 18-20.

The presently claimed method requires a "flowing of a liquid dielectric over a surface of a first electrode" as stated in Claim 5. This is contrary to the teaching of Suzuki that a solid insulator must be used. Figures 3 to 5 of Suzuki disclose an insulator provided on the inner surface of the second electrode. See column 2, lines 46-47. Insulator 3 is shown as a solid in each figure.

Suzuki cautions against the adhesion of carbonized particles to insulator 3, which may result in a spark discharge. See column 3, lines 35-40. Suzuki teaches that this is to be avoided by using engine oil "to wash away the deposits from the surface of the insulator 3." See column 3, lines 41-44. This oil "may be any oil suitable for cleaning of deposits onto the insulator 3." See column 4, lines 31-32.

Suzuki teaches away from the present invention because Suzuki discloses an oil to clean deposits off the surface of the solid insulator that is associated with the second electrode. In contrast, Claim 5 requires "flowing a liquid dielectric over the surface of the first electrode" not over the surface of an insulator.

Suzuki's invention is principally an electrostatic precipitator and does not generate the "plasma" required by Claim 5. While Suzuki discloses the use of high voltage to generate bridged stream coronas, the uniformity and power deposition limitation of his invention qualify it as a means of generating many localized coronas (i.e. streamers) extending from the projections (apparently critical) on the first electrode. Depositing conductive material on the surface of the dielectric barrier apparently causes the Suzuki device to failure. A typical capacitively coupled plasma discharge (e.g. glow discharge) with power deposition and uniformity adequate for the reaction of chemical species in a gas stream would not suffer from this failure mode. Suzuki's claim that chemical treatment is achieved by the reaction of ozone with hazardous gases and vapors (see column 3, lines 47-50) further indicates that the coronas formed in Suzuki's device lack sufficient energy and uniformity to treat the hazardous molecules directly via mechanisms such as electron impact and ion-molecule reactions. Thus, the Suzuki device is practically a novel single-stage electrostatic precipitation device with a means of continuously capturing the particles in a fluid, which prevents accumulation on the attracting electrode. The corona streamers are a means of imparting charge to the particles which are suspended in the gas flowing through the device. This assessment is further supported by Suzuki's disclosure that concentration of localized surface charge interferes with the operation of the device, thereby necessitating reversing the high voltage polarity periodically to dissipate the charge. Such subtlety is characteristic of the polarization of materials deposited on the surface of the collection electrodes in an electrostatic precipitator, whereby the deposited material assumes an opposite induced charge, which electrostatically shields the collection electrode and progressively reduces the collection efficiency. This requirement to periodically reverse the high voltage polarity also supports the assessment that Suzuki's invention is principally an electrostatic precipitator as these devices are most efficient when operated with a fixed high voltage polarity.

To differentiate, the present Moore invention is operated with either a dielectric or a conductive liquid film over the electrodes, and with or without solid (a.k.a. fixed) dielectric barriers. An essentially uniform plasma is generated throughout the gap between the electrode/fluid barriers. The activity of the plasma is such that very high chemical reaction efficiencies are achieved as required for a variety of gas, particulate, and other fluid treatment applications. Unlike the Suzuki device, the present Moore device emphasizes generating and maintaining highly reactive and uniform plasma to interact with gas or vapor phase components (including particulate) directly. Particle transport into the falling film liquid is affected primarily by convective mass transfer as the gas stream flows through the narrow gap of the plasma device.

Applicant submits that Claims 5 and 21-37 are patentable and should be allowed.

Respectfully submitted,

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